

CALIFORNIA
MODEL
FLOODPLAIN MANAGEMENT
ORDINANCE
FOR
NONCOASTAL COMMUNITIES

December 2006

This California Model Floodplain Management Ordinance has been developed as a tool to help communities meet the minimum requirements of the National Flood Insurance Program (NFIP). Communities choosing not to use this model ordinance must ensure their ordinance meets the minimum requirements of the NFIP.

Department of Water Resources
The Resources Agency, State of California

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MODEL ORDINANCE

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Instructions for Creating Your Community's Ordinance

1) PROVIDE COMMUNITY SPECIFIC INFORMATION AS REQUESTED IN BRACKETS.

This model ordinance contains **{brackets}** that must be replaced with community specific information such as your community's name, address, or name of the responsible party.

2) ACCESSORY STRUCTURES.

This model ordinance contains the definition for accessory structures and construction requirements in Section 5.1.C.5 to allow for the permitting of an **"Accessory structure"** within special flood hazard areas **without a variance**.

3) UPDATE CROSS REFERENCES.

Cross references and bracketed items throughout this document are underlined in red and bolded only to facilitate locating to ensure changes are made and to match actual numbering used by your community and not intended to reflect a suggested final format.

4) DETERMINE IF YOUR COMMUNITY WANTS TO ADOPT HIGHER STANDARDS RECOMMENDED BY THE STATE OF CALIFORNIA.

This model ordinance meets the minimum standards required to participate in the National Flood Insurance Program. Community adoption of higher standards can be applied towards credit under the Community Rating System (CRS) program and result in reduced premiums for the entire community. The State of California recommends:

- **Freeboard**. See Appendix 2.0.A, page 22.
- **Determining BFE's in Unnumbered A Zones**. See Appendix 2.0.B, page 22.
- **Determining Market Value of Existing Structures**. See Appendix 2.0.C, page 22.
- **Increased Cost of Compliance (ICC) Coverage—Repetitive Loss Provisions**. See Appendix 2.0.D, page 23.
- **Non-conversion of Enclosed Areas Below the Lowest Floor**. See Appendix 2.0.E, page 23.

5) DETERMINE IF YOUR COMMUNITY HAS SPECIAL REQUIREMENTS

- **Alluvial Fan Advisory**.
See Appendix 1.0, page 21.
- **Crawlspace Construction**.
See Appendix 3.0.A, page 24.
- **Mudslide (i.e., mudflow) Prone Areas**. (Zone M)
See Appendix 3.0.B, page 25.
- **Erosion Prone Areas**. (Zone E)
See Appendix 3.0.C, page 26.

6) PRIOR TO ADOPTION, SUBMIT DRAFT TO:

- Other community departments, including Attorney's office.
- Department of Water Resources or FEMA Region IX for review and approval.

7) AFTER ADOPTION, SEND A COPY OF THE ADOPTED ORDINANCE CERTIFIED BY THE

CITY/COUNTY CLERK TO FEMA REGION IX AND A COPY TO DWR.

**SECTION 1.0
STATUTORY AUTHORIZATION,
FINDINGS OF FACT,
PURPOSE AND METHODS**

1.1 STATUTORY AUTHORIZATION.

The Legislature of the State of California has in Government Code Sections 65302, 65560, and 65800 conferred upon local governments the authority to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the **{community governing body}** of **{name of county or municipality}** does hereby adopt the following floodplain management regulations.

1.2 FINDINGS OF FACT.

- A.** The flood hazard areas of **{name of county or municipality}** are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.
- B.** These flood losses are caused by uses that are inadequately elevated, floodproofed, or protected from flood damage. The cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities also contributes to flood losses.

1.3 STATEMENT OF PURPOSE.

It is the purpose of this ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by legally enforceable regulations applied uniformly throughout the community to all publicly and privately owned land within flood prone, mudslide [i.e. mudflow] or flood related erosion areas. These regulations are designed to:

- A.** Protect human life and health;
- B.** Minimize expenditure of public money for costly flood control projects;
- C.** Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- D.** Minimize prolonged business interruptions;
- E.** Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;
- F.** Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- G.** Ensure that potential buyers are notified that property is in an area of special flood hazard; and
- H.** Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

1.4 METHODS OF REDUCING FLOOD LOSSES.

In order to accomplish its purposes, this ordinance includes regulations to:

- A.** Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- B.** Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- C.** Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- D.** Control filling, grading, dredging, and other development which may increase flood damage;
- E.** Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas; and

SECTION 2.0 DEFINITIONS

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application.

"A zone" - see **"Special flood hazard area"**.

"Accessory structure" means a structure that is either:

1. Solely for the parking of no more than 2 cars; or
2. A small, low cost shed for limited storage, less than 150 square feet and \$1,500 in value.

"Accessory use" means a use which is incidental and subordinate to the principal use of the parcel of land on which it is located.

"Alluvial fan" means a geomorphologic feature characterized by a cone or fan-shaped deposit of boulders, gravel, and fine sediments that have been eroded from mountain slopes, transported by flood flows, and then deposited on the valley floors, and which is subject to flash flooding, high velocity flows, debris flows, erosion, sediment movement and deposition, and channel migration.

"Apex" means a point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.

"Appeal" means a request for a review of the Floodplain Administrator's interpretation of any provision of this ordinance.

"Area of shallow flooding" means a designated AO or AH Zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

"Area of special flood hazard" - See "Special flood hazard area."

"Base flood" means a flood which has a one percent chance of being equaled or exceeded in any given year (also called the "100-year flood"). Base flood is the term used throughout this ordinance.

"Base flood elevation" (BFE) means the elevation shown on the Flood Insurance Rate Map for Zones AE, AH, A1-30, VE and V1-V30 that indicates the water surface elevation resulting from a flood that has a 1-percent or greater chance of being equaled or exceeded in any given year.

"Basement" means any area of the building having its floor subgrade - i.e., below ground level - on all sides.

"Building" - see **"Structure"**.

"Development" means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

"Encroachment" means the advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a floodplain which may impede or alter the flow capacity of a floodplain.

"Existing manufactured home park or subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before **{insert date your first floodplain management ordinance was adopted}**.

"Expansion to an existing manufactured home park or subdivision" means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

"Flood, flooding, or flood water" means:

1. A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters; the unusual and rapid accumulation or runoff of surface waters from any source; and/or mudslides (i.e., mudflows); and
2. The condition resulting from flood-related erosion.

"Flood Boundary and Floodway Map (FBFM)" means the official map on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of special flood hazards and the floodway.

"Flood Insurance Rate Map (FIRM)" means the official map on which the Federal Emergency Management Agency or Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

"Flood Insurance Study" means the official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Insurance Rate Map, the Flood Boundary and Floodway Map, and the water surface elevation of the base flood.

"Floodplain or flood-prone area" means any land area susceptible to being inundated by water from any source - see **"Flooding."**

"Floodplain Administrator" is the community official designated by title to administer and enforce the floodplain management regulations.

"Floodplain management" means the operation of an overall program of corrective and preventive measures for reducing flood damage and preserving and enhancing, where possible, natural resources in the floodplain, including but not limited to emergency preparedness plans, flood control works, floodplain management regulations, and open space plans.

"Floodplain management regulations" means this ordinance and other zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as grading and erosion control) and other application of police power which control development in flood-prone areas. This term describes federal, state or local regulations in any combination thereof which provide standards for preventing and reducing flood loss and damage.

"Floodproofing" means any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures, and their contents. For guidelines on dry and wet floodproofing, see FEMA Technical Bulletins TB 1-93, TB 3-93, and TB 7-93.

"Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved

in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot. Also referred to as "Regulatory Floodway."

"Floodway fringe" is that area of the floodplain on either side of the "Regulatory Floodway" where encroachment may be permitted.

"Fraud and victimization" as related to [Section 6.0](#) of this ordinance, means that the variance granted must not cause fraud on or victimization of the public. In examining this requirement, the **{community governing body}** will consider the fact that every newly constructed building adds to government responsibilities and remains a part of the community for fifty to one-hundred years. Buildings that are permitted to be constructed below the base flood elevation are subject during all those years to increased risk of damage from floods, while future owners of the property and the community as a whole are subject to all the costs, inconvenience, danger, and suffering that those increased flood damages bring. In addition, future owners may purchase the property, unaware that it is subject to potential flood damage, and can be insured only at very high flood insurance rates.

"Functionally dependent use" means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, and does not include long-term storage or related manufacturing facilities.

"Governing body" is the local governing unit, i.e. county or municipality, that is empowered to adopt and implement regulations to provide for the public health, safety and general welfare of its citizenry.

"Hardship" as related to [Section 6](#) of this ordinance means the exceptional hardship that would result from a failure to grant the requested variance. The **{community governing body}** requires that the variance be exceptional, unusual, and peculiar to the property involved. Mere economic or financial hardship alone is not exceptional. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.

"Highest adjacent grade" means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

"Historic structure" means any structure that is:

1. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
2. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
3. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or
4. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either by an approved state program as determined by the Secretary of the Interior or directly by the Secretary of the Interior in states without approved programs.

"Levee" means a man-made structure, usually an earthen embankment, designed and constructed in accordance

with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding.

"Levee system" means a flood protection system which consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accord with sound engineering practices.

"Lowest floor" means the lowest floor of the lowest enclosed area, including basement (see **"Basement"** definition).

1. An unfinished or flood resistant enclosure below the lowest floor that is usable solely for parking of vehicles, building access or storage in an area other than a basement area, is not considered a building's lowest floor provided it conforms to applicable non-elevation design requirements, including, but not limited to:
 - a. The flood openings standard in [Section 5.1.C.3](#);
 - b. The anchoring standards in [Section 5.1.A](#);
 - c. The construction materials and methods standards in [Section 5.1.B](#); and
 - d. The standards for utilities in [Section 5.2](#).
2. For residential structures, all subgrade enclosed areas are prohibited as they are considered to be basements (see **"Basement"** definition). This prohibition includes below-grade garages and storage areas.

"Manufactured home" means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle".

"Manufactured home park or subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

"Market value" is defined in the [{name of county or municipality}](#) substantial damage/improvement procedures. See [Section 4.2.B.1](#).

"Mean sea level" means, for purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD) of 1988, or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map are referenced.

"New construction", for floodplain management purposes, means structures for which the "start of construction" commenced on or after [{insert date your first floodplain management ordinance was adopted}](#), and includes any subsequent improvements to such structures.

"New manufactured home park or subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after [{insert date your first floodplain management ordinance was adopted}](#).

"Obstruction" includes, but is not limited to, any dam, wall, wharf, embankment, levee, dike, pile, abutment, protection, excavation, channelization, bridge, conduit, culvert, building, wire, fence, rock, gravel, refuse, fill, structure, vegetation or other material in, along, across or projecting into any watercourse which may alter, impede, retard or change the direction and/or velocity of the flow of water, or due to its location, its propensity to

snare or collect debris carried by the flow of water, or its likelihood of being carried downstream.

"One-hundred-year flood" or "100-year flood" - see **"Base flood."**

"Program deficiency" means a defect in a community's floodplain management regulations or administrative procedures that impairs effective implementation of those floodplain management regulations.

"Public safety and nuisance" as related to **Section 6** of this ordinance, means that the granting of a variance must not result in anything which is injurious to safety or health of an entire community or neighborhood, or any considerable number of persons, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, bay, stream, canal, or basin.

"Recreational vehicle" means a vehicle which is:

1. Built on a single chassis;
2. 400 square feet or less when measured at the largest horizontal projection;
3. Designed to be self-propelled or permanently towable by a light-duty truck; and
4. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

"Regulatory floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

"Remedy a violation" means to bring the structure or other development into compliance with State or local floodplain management regulations, or if this is not possible, to reduce the impacts of its noncompliance. Ways that impacts may be reduced include protecting the structure or other affected development from flood damages, implementing the enforcement provisions of the ordinance or otherwise deterring future similar violations, or reducing State or Federal financial exposure with regard to the structure or other development.

"Riverine" means relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

"Sheet flow area" - see **"Area of shallow flooding."**

"Special flood hazard area (SFHA)" means an area in the floodplain subject to a 1 percent or greater chance of flooding in any given year. It is shown on an FHBM or FIRM as Zone A, AO, A1-A30, AE, A99, or, AH.

"Start of construction" includes substantial improvement and other proposed new development and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days from the date of the permit. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufacture home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

"Structure" means a walled and roofed building that is principally above ground; this includes a gas or liquid storage tank or a manufactured home.

"Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

"Substantial improvement" means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage", regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations or state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or
2. Any alteration of a "historic structure," provided that the alteration will not preclude the structure's continued designation as a "historic structure."

"Variance" means a grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by this ordinance.

"Violation" means the failure of a structure or other development to be fully compliant with this ordinance. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this ordinance is presumed to be in violation until such time as that documentation is provided.

"Water surface elevation" means the height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD) of 1988, or other datum, of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

"Watercourse" means a lake, river, creek, stream, wash, arroyo, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

SECTION 3.0 GENERAL PROVISIONS

3.1 LANDS TO WHICH THIS ORDINANCE APPLIES.

This ordinance shall apply to all areas of special flood hazards within the jurisdiction of {name of county or municipality}.

3.2 BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD.

The areas of special flood hazard identified by the Federal Emergency Management Agency (FEMA) in the "Flood Insurance Study (FIS) for {name of county or municipality (exact title of study)}" dated {date}, with accompanying Flood Insurance Rate Maps (FIRM's) and Flood Boundary and Floodway Maps (FBFM's), dated {date}, and all subsequent amendments and/or revisions, are hereby adopted by reference and declared to be a part of this ordinance. This FIS and attendant mapping is the minimum area of applicability of this ordinance and may be supplemented by studies for other areas which allow implementation of this ordinance and which are recommended to the {community governing body} by the Floodplain Administrator. The study, FIRM's and FBFM's are on file at {department, address}.

3.3 COMPLIANCE.

No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this ordinance and other applicable regulations. Violation of the requirements (including violations of conditions and safeguards) shall constitute a misdemeanor. Nothing herein shall prevent the {community governing body} from taking such lawful action as is necessary to prevent or remedy any violation.

3.4 ABROGATION AND GREATER RESTRICTIONS.

This ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance and another ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

3.5 INTERPRETATION.

In the interpretation and application of this ordinance, all provisions shall be:

- A. Considered as minimum requirements;
- B. Liberally construed in favor of the governing body; and
- C. Deemed neither to limit nor repeal any other powers granted under state statutes.

3.6 WARNING AND DISCLAIMER OF LIABILITY.

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of {community governing body}, any officer or employee thereof, the State of California, or the Federal Emergency Management Agency, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

3.7 SEVERABILITY.

This ordinance and the various parts thereof are hereby declared to be severable. Should any section of this

ordinance be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of the ordinance as a whole, or any portion thereof other than the section so declared to be unconstitutional or invalid.

SECTION 4.0 ADMINISTRATION

4.1 DESIGNATION OF THE FLOODPLAIN ADMINISTRATOR.

The {e.g., **City Manager, Director of Planning, Public Works, or Building Official, etc.**} is hereby appointed to administer, implement, and enforce this ordinance by granting or denying development permits in accord with its provisions.

4.2 DUTIES AND RESPONSIBILITIES OF THE FLOODPLAIN ADMINISTRATOR.

The duties and responsibilities of the Floodplain Administrator shall include, but not be limited to the following:

A. Permit Review.

Review all development permits to determine:

1. Permit requirements of this ordinance have been satisfied, including determination of substantial improvement and substantial damage of existing structures;
2. All other required state and federal permits have been obtained;
3. The site is reasonably safe from flooding;
4. The proposed development does not adversely affect the carrying capacity of areas where base flood elevations have been determined but a floodway has not been designated. This means that the cumulative effect of the proposed development when combined with all other existing and anticipated development will not increase the water surface elevation of the base flood more than 1 foot at any point within the {name of county or municipality}; and
5. All Letters of Map Revision (LOMR's) for flood control projects are approved prior to the issuance of building permits. Building Permits must not be issued based on Conditional Letters of Map Revision (CLOMR's). Approved CLOMR's allow construction of the proposed flood control project and land preparation as specified in the "start of construction" definition.

B. Development of Substantial Improvement and Substantial Damage Procedures.

1. Using FEMA publication FEMA 213, "Answers to Questions About Substantially Damaged Buildings," develop detailed procedures for identifying and administering requirements for substantial improvement and substantial damage, to include defining "Market Value."
2. Assure procedures are coordinated with other departments/divisions and implemented by community staff.

C. Review, Use and Development of Other Base Flood Data.

When base flood elevation data has not been provided in accordance with **Section 3.2**, the Floodplain Administrator shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal or state agency, or other source, in order to administer **Section 5**.

NOTE: A base flood elevation may be obtained using one of two methods from the FEMA publication, FEMA 265, "Managing Floodplain Development in Approximate Zone A Areas – A Guide for Obtaining and Developing Base (100-year) Flood Elevations" dated July 1995.

D. Notification of Other Agencies.

1. Alteration or relocation of a watercourse:
 - a. Notify adjacent communities and the California Department of Water Resources prior to alteration or relocation;
 - b. Submit evidence of such notification to the Federal Emergency Management Agency; and
 - c. Assure that the flood carrying capacity within the altered or relocated portion of said watercourse is maintained.
2. Base Flood Elevation changes due to physical alterations:
 - a. Within 6 months of information becoming available or project completion, whichever comes first, the floodplain administrator shall submit or assure that the permit applicant submits technical or scientific data to FEMA for a Letter of Map Revision (LOMR).
 - b. All LOMR's for flood control projects are approved prior to the issuance of building permits. Building Permits must not be issued based on Conditional Letters of Map Revision (CLOMR's). Approved CLOMR's allow construction of the proposed flood control project and land preparation as specified in the "start of construction" definition.

Such submissions are necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements are based on current data.

3. Changes in corporate boundaries:

Notify FEMA in writing whenever the corporate boundaries have been modified by annexation or other means and include a copy of a map of the community clearly delineating the new corporate limits.

E. Documentation of Floodplain Development.

Obtain and maintain for public inspection and make available as needed the following:

1. Certification required by [Section 5.1.C.1 and Section 5.4](#) (lowest floor elevations);
2. Certification required by [Section 5.1.C.2](#) (elevation or floodproofing of nonresidential structures);
3. Certification required by [Sections 5.1.C.3](#) (wet floodproofing standard);
4. Certification of elevation required by [Section 5.3.A.3](#) (subdivisions and other proposed development standards);
5. Certification required by [Section 5.6.B](#) (floodway encroachments); and
6. Maintain a record of all variance actions, including justification for their issuance, and report such variances issued in its biennial report submitted to the Federal Emergency Management Agency.

F. Map Determination.

Make interpretations where needed, as to the exact location of the boundaries of the areas of special

flood hazard, where there appears to be a conflict between a mapped boundary and actual field conditions. The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in [Section 4.4](#).

F. Remedial Action.

Take action to remedy violations of this ordinance as specified in [Section 3.3](#).

G. Biennial Report.

Complete and submit Biennial Report to FEMA.

H. Planning.

Assure community's General Plan is consistent with floodplain management objectives herein.

4.3 DEVELOPMENT PERMIT.

A development permit shall be obtained before any construction or other development, including manufactured homes, within any area of special flood hazard established in [Section 3.2](#). Application for a development permit shall be made on forms furnished by the **{name of community}**. The applicant shall provide the following minimum information:

A. Plans in duplicate, drawn to scale, showing:

1. Location, dimensions, and elevation of the area in question, existing or proposed structures, storage of materials and equipment and their location;
2. Proposed locations of water supply, sanitary sewer, and other utilities;
3. Grading information showing existing and proposed contours, any proposed fill, and drainage facilities;
4. Location of the regulatory floodway when applicable;
5. Base flood elevation information as specified in [Section 3.2 or Section 4.2.C](#);
6. Proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all structures; and
7. Proposed elevation in relation to mean sea level to which any nonresidential structure will be floodproofed, as required in [Section 5.1.C.2](#) of this ordinance and detailed in FEMA Technical Bulletin TB 3-93.

B. Certification from a registered civil engineer or architect that the nonresidential floodproofed building meets the floodproofing criteria in [Section 5.1.C.2](#).

C. For a crawl-space foundation, location and total net area of foundation openings as required in [Section 5.1.C.3](#) of this ordinance and detailed in FEMA Technical Bulletins 1-93 and 7-93.

D. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

E. All appropriate certifications listed in [Section 4.2.E](#) of this ordinance.

4.4 APPEALS.

The **{community governing body}** of **{name of county or municipality}** shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the Floodplain

Administrator in the enforcement or administration of this ordinance.

SECTION 5.0 PROVISIONS FOR FLOOD HAZARD REDUCTION

5.1 STANDARDS OF CONSTRUCTION.

In all areas of special flood hazards the following standards are required:

A. Anchoring.

All new construction and substantial improvements of structures, including manufactured homes, shall be adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.

B. Construction Materials and Methods.

All new construction and substantial improvements of structures, including manufactured homes, shall be constructed:

1. With flood resistant materials, and utility equipment resistant to flood damage for areas below the base flood elevation;
2. Using methods and practices that minimize flood damage;
3. With electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding; and
4. Within Zones AH or AO, so that there are adequate drainage paths around structures on slopes to guide flood waters around and away from proposed structures.

C. Elevation and Floodproofing.

1. Residential construction.

All new construction or substantial improvements of residential structures shall have the lowest floor, including basement:

- a. In AE, AH, A1-30 Zones, elevated to or above the base flood elevation.
- b. In an AO zone, elevated above the highest adjacent grade to a height equal to or exceeding the depth number specified in feet on the FIRM, or elevated at least 2 feet above the highest adjacent grade if no depth number is specified.
- c. In an A zone, without BFE's specified on the FIRM [unnumbered A zone], elevated to or above the base flood elevation; as determined under [**Section 4.2.C.**](#)

Upon the completion of the structure, the elevation of the lowest floor, including basement, shall be certified by a registered civil engineer or licensed land surveyor, and verified by the community building inspector to be properly elevated. Such certification and verification shall be provided to the Floodplain Administrator.

2. **Nonresidential construction.**

All new construction or substantial improvements of nonresidential structures shall either be elevated to conform with **Section 5.1.C.1** or:

- a. Be floodproofed, together with attendant utility and sanitary facilities, below the elevation recommended under **Section 5.1.C.1**, so that the structure is watertight with walls substantially impermeable to the passage of water;
- b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
- c. Be certified by a registered civil engineer or architect that the standards of **Section 5.1 C.2.a & b** are satisfied. Such certification shall be provided to the Floodplain Administrator.

3. **Flood openings.**

All new construction and substantial improvements of structures with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwater. Designs for meeting this requirement must meet the following minimum criteria:

- a. For non-engineered openings:
 1. Have a minimum of two openings on different sides having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
 2. The bottom of all openings shall be no higher than one foot above grade;
 3. Openings may be equipped with screens, louvers, valves or other coverings or devices provided that they permit the automatic entry and exit of floodwater; and
 4. Buildings with more than one enclosed area must have openings on exterior walls for each area to allow flood water to directly enter; or
- b. Be certified by a registered civil engineer or architect.

4. **Manufactured homes.**

- a. See **Section 5.4.**

5. Garages and low cost accessory structures.

a. Attached garages.

1. A garage attached to a residential structure, constructed with the garage floor slab below the BFE, must be designed to allow for the automatic entry of flood waters. See [Section 5.1.C.3](#). Areas of the garage below the BFE must be constructed with flood resistant materials. See [Section 5.1.B](#).
2. A garage attached to a nonresidential structure must meet the above requirements or be dry floodproofed. For guidance on below grade parking areas, see FEMA Technical Bulletin TB-6.

b. Detached garages and accessory structures.

1. "Accessory structures" used solely for parking (2 car detached garages or smaller) or limited storage (small, low-cost sheds), as defined in [Section 2](#), may be constructed such that its floor is below the base flood elevation (BFE), provided the structure is designed and constructed in accordance with the following requirements:
 - a) Use of the accessory structure must be limited to parking or limited storage;
 - b) The portions of the accessory structure located below the BFE must be built using flood-resistant materials;
 - c) The accessory structure must be adequately anchored to prevent flotation, collapse and lateral movement;
 - d) Any mechanical and utility equipment in the accessory structure must be elevated or floodproofed to or above the BFE;
 - e) The accessory structure must comply with floodplain encroachment provisions in [Section 5.6](#); and
 - f) The accessory structure must be designed to allow for the automatic entry of flood waters in accordance with [Section 5.1.C.3](#).
2. Detached garages and accessory structures not meeting the above standards must be constructed in accordance with all applicable standards in [Section 5.1](#).

5.2 STANDARDS FOR UTILITIES.

- A.** All new and replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate:
1. Infiltration of flood waters into the systems; and
 2. Discharge from the systems into flood waters.
- B.** On-site waste disposal systems shall be located to avoid impairment to them, or contamination from them during flooding.

5.3 STANDARDS FOR SUBDIVISIONS AND OTHER PROPOSED DEVELOPMENT.

- A.** All new subdivisions proposals and other proposed development, including proposals for manufactured home parks and subdivisions, greater than 50 lots or 5 acres, whichever is the lesser, shall:
 - 1. Identify the Special Flood Hazard Areas (SFHA) and Base Flood Elevations (BFE).
 - 2. Identify the elevations of lowest floors of all proposed structures and pads on the final plans.
 - 3. If the site is filled above the base flood elevation, the following as-built information for each structure shall be certified by a registered civil engineer or licensed land surveyor and provided as part of an application for a Letter of Map Revision based on Fill (LOMR-F) to the Floodplain Administrator:
 - a. Lowest floor elevation.
 - b. Pad elevation.
 - c. Lowest adjacent grade.
- B.** All subdivision proposals and other proposed development shall be consistent with the need to minimize flood damage.
- C.** All subdivision proposals and other proposed development shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
- D.** All subdivisions and other proposed development shall provide adequate drainage to reduce exposure to flood hazards.

5.4 STANDARDS FOR MANUFACTURED HOMES.

- A.** All manufactured homes that are placed or substantially improved, on sites located: (1) outside of a manufactured home park or subdivision; (2) in a new manufactured home park or subdivision; (3) in an expansion to an existing manufactured home park or subdivision; or (4) in an existing manufactured home park or subdivision upon which a manufactured home has incurred "substantial damage" as the result of a flood, shall:
 - 1. Within Zones A1-30, AH, and AE on the community's Flood Insurance Rate Map, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to or above the base flood elevation and be securely fastened to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
- B.** All manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A1-30, AH, and AE on the community's Flood Insurance Rate Map that are not subject to the provisions of **Section 5.4.A** will be securely fastened to an adequately anchored foundation system to resist flotation, collapse, and lateral movement, and be elevated so that either the:
 - 1. Lowest floor of the manufactured home is at or above the base flood elevation; or
 - 2. Manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade.

Upon the completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered civil engineer or licensed land surveyor, and verified by the community building inspector to be properly elevated. Such certification and verification shall be provided to the Floodplain Administrator.

5.5 STANDARDS FOR RECREATIONAL VEHICLES.

- A.** All recreational vehicles placed in Zones A1-30, AH, and AE will either:
1. Be on the site for fewer than 180 consecutive days; or
 2. Be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or
 3. Meet the permit requirements of **Section 4.3** of this ordinance and the elevation and anchoring requirements for manufactured homes in **Section 5.4.A**.

5.6 FLOODWAYS.

Since floodways are an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles, and erosion potential, the following provisions apply:

- A.** Until a regulatory floodway is adopted, no new construction, substantial development, or other development (including fill) shall be permitted within Zones A1-30 and AE, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other development, will not increase the water surface elevation of the base flood more than 1 foot at any point within the **{name of county or municipality}**.
- B.** Within an adopted regulatory floodway, the **{name of county or municipality}** shall prohibit encroachments, including fill, new construction, substantial improvements, and other development, unless certification by a registered civil engineer is provided demonstrating that the proposed encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.
- C.** If **Sections 5.6.A & B** are satisfied, all new construction, substantial improvement, and other proposed new development shall comply with all other applicable flood hazard reduction provisions of **Section 5**.

SECTION 6.0 VARIANCE PROCEDURE

6.1 NATURE OF VARIANCES.

The issuance of a variance is for floodplain management purposes only. Insurance premium rates are determined by statute according to actuarial risk and will not be modified by the granting of a variance.

The variance criteria set forth in this section of the ordinance are based on the general principle of zoning law that variances pertain to a piece of property and are not personal in nature. A variance may be granted for a parcel of property with physical characteristics so unusual that complying with the requirements of this ordinance would create an exceptional hardship to the applicant or the surrounding property owners. The characteristics must be unique to the property and not be shared by adjacent parcels. The unique characteristic must pertain to the land itself, not to the structure, its inhabitants, or the property owners.

It is the duty of the **{community governing body}** to help protect its citizens from flooding. This need is so compelling and the implications of the cost of insuring a structure built below flood level are so serious that variances from the flood elevation or from other requirements in the flood ordinance are quite rare. The long term goal of preventing and reducing flood loss and damage can only be met if variances are strictly limited. Therefore, the variance guidelines provided in this ordinance are more detailed and contain multiple provisions that must be met before a variance can be properly granted. The criteria are designed to screen out those situations in which alternatives other than a variance are more appropriate.

6.2 CONDITIONS FOR VARIANCES.

- A. Generally, variances may be issued for new construction, substantial improvement, and other proposed new development to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing that the procedures of **Sections 4 and 5** of this ordinance have been fully considered. As the lot size increases beyond one-half acre, the technical justification required for issuing the variance increases.
- B. Variances may be issued for the repair or rehabilitation of "**historic structures**" (as defined in **Section 2** of this ordinance) upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as an historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
- C. Variances shall not be issued within any mapped regulatory floodway if any increase in flood levels during the base flood discharge would result.
- D. Variances shall only be issued upon a determination that the variance is the "minimum necessary" considering the flood hazard, to afford relief. "Minimum necessary" means to afford relief with a minimum of deviation from the requirements of this ordinance. For example, in the case of variances to an elevation requirement, this means the **{community governing body}** need not grant permission for the applicant to build at grade, or even to whatever elevation the applicant proposes, but only to that elevation which the **{community governing body}** believes will both provide relief and preserve the integrity of the local ordinance.

- E. Any applicant to whom a variance is granted shall be given written notice over the signature of a community official that:
1. The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage, and
 2. Such construction below the base flood level increases risks to life and property. It is recommended that a copy of the notice shall be recorded by the Floodplain Administrator in the Office of the {name of county} Recorder and shall be recorded in a manner so that it appears in the chain of title of the affected parcel of land.
- F. The Floodplain Administrator will maintain a record of all variance actions, including justification for their issuance, and report such variances issued in its biennial report submitted to the Federal Emergency Management Agency.

6.3 APPEAL BOARD.

- A. In passing upon requests for variances, the {community governing body} shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and the:
1. Danger that materials may be swept onto other lands to the injury of others;
 2. Danger of life and property due to flooding or erosion damage;
 3. Susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the existing individual owner and future owners of the property;
 4. Importance of the services provided by the proposed facility to the community;
 5. Necessity to the facility of a waterfront location, where applicable;
 6. Availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
 7. Compatibility of the proposed use with existing and anticipated development;
 8. Relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
 9. Safety of access to the property in time of flood for ordinary and emergency vehicles;
 10. Expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site; and
 11. Costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water system, and streets and bridges.

B. Variances shall only be issued upon a:

1. Showing of good and sufficient cause;
2. Determination that failure to grant the variance would result in exceptional **"hardship"** to the applicant; and
3. Determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, or extraordinary public expense, create a nuisance (see **"Public safety and nuisance"**), cause **"fraud and victimization"** of the public, or conflict with existing local laws or ordinances.

C. Variances may be issued for new construction, substantial improvement, and other proposed new development necessary for the conduct of a functionally dependent use provided that the provisions of **Sections 6.3.A through 6.3.D** are satisfied and that the structure or other development is protected by methods that minimize flood damages during the base flood and does not result in additional threats to public safety and does not create a public nuisance.

D. Upon consideration of the factors of **Section 6.2.A** and the purposes of this ordinance, the **{community governing body}** may attach such conditions to the granting of variances as it deems necessary to further the purposes of this ordinance.

APPENDIX

Appendices

1.0 ALLUVIAL FAN ADVISORY

Hazards of Alluvial Fan Development

Alluvial fans present a unique flood hazard environment where the combination of sediment, slope, and topography create an ultra hazardous condition for which elevation on fill will not provide reliable protection. Active alluvial fan flooding is characterized by flow path uncertainty combined with abrupt deposition and erosion. As a result, any area of an alluvial fan may be subject to intense flood hazards.

The technology of mathematically modeling the hydrodynamics of water and debris flows for alluvial fans is still in the early development stage. The Federal Emergency Management Agency (FEMA) has formulated a mapping procedure for the purpose of defining the likelihood of flood hazards on inundated alluvial fan zones to be used for flood insurance purposes and general floodplain regulation, referred to as the FEMA alluvial fan methodology.

An active alluvial fan flooding hazard is indicated by three related criteria:

- a. Flow path uncertainty below the hydrographic apex;
- b. Abrupt deposition and ensuing erosion of sediment as a stream or debris flow loses its competence to carry material eroded from a steeper, upstream source area; and
- c. An environment where the combination of sediment availability, slope, and topography creates an ultra hazardous condition for which elevation on fill will not reliably mitigate the risk.

Inactive alluvial fan flooding is similar to traditional riverine flood hazards, but occurs only on alluvial fans. It is characterized by flow paths with a higher degree of certainty in realistic assessments of flood risk or in the reliable mitigation of the hazard. Counter to active alluvial fan flooding hazards, an inactive alluvial fan flooding hazard is characterized by relatively stable flow paths. However, areas of inactive alluvial fan flooding, as with active alluvial fan flooding, may be subject to sediment deposition and erosion, but to a degree that does not cause flow path instability and uncertainty.

An alluvial fan may exhibit both active alluvial fan flooding and inactive alluvial fan flooding hazards. The hazards may vary spatially or vary at the same location, contingent on the level of flow discharge. Spatially, for example, upstream inactive portions of the alluvial fan may distribute flood flow to active areas at the distal part of the alluvial fan. Hazards may vary at the same location, for example, with a flow path that may be stable for lower flows, but become unstable at higher flows.

More detailed information can be found at FEMA's website: "Guidelines for Determining Flood Hazards on Alluvial Fans" at http://www.fema.gov/fhm/ft_afgd2.shtm#1.

Alluvial Fans and LOMR's

The NFIP does not allow for the removal of land from the floodplain based on the placement of fill (LOMR-F) in alluvial fan flood hazard areas. The NFIP will credit a major structural flood control project, through the LOMR process, that will effectively eliminate alluvial fan flood hazards from the protected area. Details about map revisions for alluvial fan areas can be found in the Code of Federal Regulations at Title 44, Part 65.13.

Alluvial Fan Task Force

As stated in AB 2141 (Longville, Chapter 878, Statutes of 2004), the State of California Department of Water Resources will convene an Alluvial Fan Task Force (AFTF). The AFTF will produce an alluvial fan model

ordinance for local communities and a recommendations report to the legislature. As of March 2006, the model ordinance and report are projected to be completed by 2007.

2.0 HIGHER STANDARDS RECOMMENDED BY THE STATE OF CALIFORNIA

This model ordinance meets the minimum standards required to participate in the National Flood Insurance Program. Community adoption of higher standards can be applied towards credit under the Community Rating System (CRS) program and result in reduced premiums for all flood insurance policy holders within the entire community. The State of California recommends:

A. Freeboard.

- To elevate at least 2 feet above the minimum required base flood elevation, make the following changes:
 1. Modify Sections 5.1.C.1.a, 5.1.C.1.c, and 5.4.A.1 by replacing “elevated to or above” with “elevated 2 feet above.”
 2. Modify Section 5.4.B.1 by replacing “at or above” with “at least 2 feet above.”
 3. Replace Section 5.1.C.1.b with:

In an AO zone, elevated above the highest adjacent grade to a height 2 feet above the depth number specified in feet on the FIRM, or elevated at least 4 feet above the highest adjacent grade if no depth number is specified.

B. Determining BFE's in Unnumbered A Zones.

- Replace “may” with “shall” in the second paragraph of Section 4.2.C to read:

“NOTE: A base flood elevation shall....”

C. Determining Market Value of Existing Structures.

- Replace the “Market value” definition in Section 2 with:

“**Market value**” shall be determined by estimating the cost to replace the structure in new condition and adjusting that cost figure by the amount of depreciation which has accrued since the structure was constructed.

1. The cost of replacement of the structure shall be based on a square foot cost factor determined by reference to a building cost estimating guide recognized by the building construction industry.
2. The amount of depreciation shall be determined by taking into account the age and physical deterioration of the structure and functional obsolescence as approved by the floodplain administrator, but shall not include economic or other forms of external obsolescence.

Use of replacement costs or accrued depreciation factors different from those contained in recognized building cost estimating guides may be considered only if such factors are included in a report prepared by an independent professional appraiser and supported by a written explanation of the differences.

D. Increased Cost of Compliance (ICC) Coverage—Repetitive Loss Provisions.

This provision allows communities the opportunity for flood insurance policy holders to have ICC coverage made available in repetitive loss situations.

- Modify the definition of “Substantial damage” as follows:

“**Substantial damage**” means:

1. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred; or
2. Flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such event, on the average, equals or exceeds 25 percent of the market value of the structure before the damage occurred. This is also known as “repetitive loss.”

E. Non-conversion of Enclosed Areas Below the Lowest Floor.

- Insert/add the following section as Section 4.2.J.

A. Non-conversion of Enclosed Areas Below the Lowest Floor.

To ensure that the areas below the BFE shall be used solely for parking vehicles, limited storage, or access to the building and not be finished for use as human habitation without first becoming fully compliant with the floodplain management ordinance in effect at the time of conversion, the Floodplain Administrator shall:

1. Determine which applicants for new construction and/or substantial improvements have fully enclosed areas below the lowest floor that are 5 feet or higher;
2. Enter into a “NON-CONVERSION AGREEMENT FOR CONSTRUCTION WITHIN FLOOD HAZARD AREAS” or equivalent with the {name of county or municipality}. The agreement shall be recorded with the {name of county} County Recorder as a deed restriction. The non-conversion agreement shall be in a form acceptable to the Floodplain Administrator and County Counsel; and
3. Have the authority to inspect any area of a structure below the base flood elevation to ensure compliance upon prior notice of at least 72 hours.

3.0 SPECIAL REQUIREMENTS

A. Crawlspace Construction.

Communities with construction practices that result in crawl spaces with interior floors up to 2 feet below grade have historically been in violation of the NFIP requirements. FEMA Technical Bulletin 11-01 now provides accommodation for these practices.

- Remove the following from “Lowest floor” definition in Section 2:
 2. For residential structures, all subgrade enclosed areas are prohibited as they are considered to be basements (see “**Basement**” definition). This prohibition includes below-grade garages and storage areas.
- Add the following section into your ordinance at Section 5.1.C:

5.1.C.(X) Crawlspace Construction.

This sub-section applies to buildings with crawl spaces up to 2 feet below grade. Below-grade crawl space construction in accordance with the requirements listed below will not be considered basements.

- a. The building must be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Crawl space construction is not allowed in areas with flood velocities greater than 5 feet per second unless the design is reviewed by a qualified design professional, such as a registered architect or professional engineer;
- b. The crawl space is an enclosed area below the BFE and, as such, must have openings that equalize hydrostatic pressures by allowing for the automatic entry and exit of floodwaters. For guidance on flood openings, see FEMA Technical Bulletin 11-93;
- c. Crawl space construction is not permitted in V zones. Open pile or column foundations that withstand storm surge and wave forces are required in V zones;
- d. Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawl space used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE; and
- e. Any building utility systems within the crawl space must be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions.
- f. Requirements for all below-grade crawl space construction, in addition to the above requirements, to include the following:
 1. The interior grade of a crawl space below the BFE must not be more than 2 feet below the lowest adjacent exterior grade (LAG), shown as D in figure 3 of Technical Bulletin 11-01;

2. The height of the below-grade crawl space, measured from the interior grade of the crawl space to the top of the crawl space foundation wall must not exceed 4 feet (shown as L in figure 3 of Technical Bulletin 11-01) at any point;
3. There must be an adequate drainage system that removes floodwaters from the interior area of the crawl space within a reasonable period of time after a flood event, not to exceed 72 hours; and
4. The velocity of floodwaters at the site should not exceed 5 feet per second for any crawl space. For velocities in excess of 5 feet per second, other foundation types should be used.

B. Mudslide (i.e., Mudflow) Prone Areas. (Zone M)

- Communities with mudslide prone areas shall insert the following:

1. Definitions to Section 2:

"Area of special mudslide (i.e., mudflow) hazard" is the area subject to severe mudslides (i.e., mudflows). The area is designated as Zone M on the Flood Insurance Rate Map (FIRM).

"Mudslide" describes a condition where there is a river, flow or inundation of liquid mud down a hillside, usually as a result of a dual condition of loss of brush cover and the subsequent accumulation of water on the ground, preceded by a period of unusually heavy or sustained rain.

"Mudslide (i.e., mudflow) prone area" means an area with land surfaces and slopes of unconsolidated material where the history, geology, and climate indicate a potential for mudflow.

2. Section **5.{X} Mudslide (i.e., Mudflow) Prone Areas**:

5.{X} Mudslide (i.e., Mudflow) Prone Areas.

- A. The Floodplain Administrator shall review permits for proposed construction of other development to determine if it is proposed within a mudslide area.
- B. Permits shall be reviewed to determine that the proposed site and improvement will be reasonably safe from mudslide hazards. Factors to be considered in making this determination include, but are not limited to:
 1. The type and quality of soils;
 2. Evidence of ground water or surface water problems;
 3. Depth and quality of any fill;
 4. Overall slope of the site; and
 5. Weight that any proposed development will impose on the slope.

- C. Within areas which may have mudslide hazards, the Floodplain Administrator shall require:
1. A site investigation and further review by persons qualified in geology and soils engineering;
 2. The proposed grading, excavation, new construction, and substantial improvement be adequately designed and protected against mudslide damages;
 3. The proposed grading, excavations, new construction, and substantial improvement not aggravate the existing hazard by creating either on-site or off-site disturbances; and
 4. Drainage, planting, watering, and maintenance not endanger slope stability.

C. **Erosion-prone areas.** (Zone E)

- Communities with erosion prone areas shall insert the following:

1. Definitions into Section 2:

"Area of special flood-related erosion hazard" is the land within a community which is most likely to be subject to severe flood-related erosion losses. The area may be designated as Zone E on the Flood Insurance Rate Map (FIRM).

"Flood-related erosion" means the collapse or subsidence of land along the shore of a lake or other body of water as a result of undermining caused by waves or currents of water exceeding anticipated cyclical level or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge, or by some similarly unusually and unforeseeable event which results in flooding.

"Flood-related erosion area" or **"Flood-related erosion prone area"** means a land area adjoining the shore of a lake or other body of water, which due to the composition of the shoreline or bank and high water levels or wind-driven currents, is likely to suffer flood-related erosion damage.

"Flood-related erosion area management" means the operation of an overall program of corrective and preventive measures for reducing flood-related erosion damage, including but not limited to emergency preparedness plans, flood-related erosion control works, and floodplain management regulations.

2. Section "~~5.(X)~~ FLOOD-RELATED EROSION-PRONE AREA" into Section 5:

~~5.(X)~~ FLOOD-RELATED EROSION-PRONE AREA

- A. The Floodplain Administrator shall require permits for proposed construction and other development within all flood-related erosion-prone areas known to the community.
- B. Permit applications shall be reviewed to determine whether the proposed site alterations and improvements will be reasonably safe from flood-related erosion, and will not cause flood-related erosion hazards or otherwise aggravate the existing hazard.
- C. If a proposed improvement is found to be in the path of flood-related erosion or would increase the erosion hazard, such improvement shall be relocated or adequate protective measures shall be taken to avoid aggravating the existing erosion hazard.
- D. Within Zone E on the Flood Insurance Rate Map, a setback is required for all new development from the ocean, lake, bay, riverfront or other body of water to create a safety buffer consisting of a natural vegetative or contour strip. This buffer shall be designated according to the flood-related erosion hazard and erosion rate, in relation to the anticipated "useful life" of structures, and depending upon the geologic, hydrologic, topographic, and climatic characteristics of the land. The buffer may be used for suitable open space purposes, such as for agricultural, forestry, outdoor recreation and wildlife habitat areas, and for other activities using temporary and portable structures only.